

WHAT IS CLAIMED IS:

1. A braking force distribution control device comprising:

wheel speed detecting means for detecting wheel speeds of respective wheels of a vehicle;

road surface  $\mu$  slope estimating means for, on the basis of the detected wheel speeds, estimating for the respective wheels slopes of a coefficient of friction  $\mu$  between the wheels and a road surface as road surface  $\mu$  slopes; and

control means for, on the basis of the road surface  $\mu$  slopes estimated for the respective wheels by the road surface  $\mu$  slope estimating means, distributing braking forces to the respective wheels by controlling the braking force of each wheel.

2. A braking force distribution control device according to claim 1, wherein on the basis of the detected wheel speeds, the road surface  $\mu$  slope estimating means estimates slopes of braking forces with respect to wheel slip speeds as the road surface  $\mu$  slopes for the respective wheels, and the control means controls a braking torque of a wheel which is an object of control on the basis of the road surface  $\mu$  slope of the wheel which is an object of control and the road surface  $\mu$  slope of a reference wheel among the road surface  $\mu$  slopes estimated by the road surface  $\mu$  slope estimating means.

3. A braking force distribution control device according to claim 2, wherein in a case in which front wheels are reference wheels and rear wheels are wheels which are objects of control, when a variation between the road surface  $\mu$  slope of the front wheels and the road surface  $\mu$  slope of the rear wheels is greater than or equal to a predetermined value, the control means one of maintains and reduces the braking torque of the rear wheels, and when the variation is less than the predetermined value, the control means increases the braking torque of the rear wheels.

4. A braking force distribution control device according to claim 3, wherein when the control means one of maintains and reduces the braking torque of one of the rear wheels, the control means maintains the braking torque of another of the rear wheels as is.

5. A braking force distribution control device according to claim 2, wherein in a case in which rear wheels are reference wheels and front wheels are wheels which are objects of control, when a variation between the road surface  $\mu$  slope of the front wheels and the road surface  $\mu$  slope of the rear wheels is greater than or equal to a predetermined value, the control means increases the braking torque of the front wheels, and when the variation is less than the predetermined value, the control means one of maintains and reduces the braking torque of the front wheels.

Close

6. A braking force slope distribution device according to claim 2, wherein in a case in which turning inner side wheels are reference wheels and turning outer side wheels are wheels which are objects of control, when a variation between the road surface  $\mu$  slope of the turning inner side wheels and the road surface  $\mu$  slope of the turning outer side wheels is greater than or equal to a predetermined value, the control means increases the braking torque of the turning outer side wheels, and when the variation is less than the predetermined value, the control means one of maintains and reduces the braking torque of the turning outer side wheels.

7. A braking force distribution control device according to claim 2, wherein in a case in which turning outer side wheels are reference wheels and turning inner side wheels are wheels which are objects of control, when a variation between the road surface  $\mu$  slope of the turning outer side wheels and the road surface  $\mu$  slope of the turning inner side wheels is greater than or equal to a predetermined value, the control means one of maintains and reduces the braking torque of the turning inner side wheels, and when the variation is less than the predetermined value, the control means increases the braking torque of the turning inner side wheels.

8. A braking force distribution control device according to claim

2, wherein the control means controls the braking torque by using one of a turning inner side front wheel, a turning outer side front wheel, a turning inner side rear wheel, and a turning outer side rear wheel as a reference wheel, and using at least one other wheel as the wheel which is an object of control.

9. A braking force distribution control device according to claim 1, wherein the control means includes:

a wheel target braking force computing means for computing target braking forces of the respective wheels on the basis of the estimated road surface  $\mu$  slopes of the respective wheels and a target braking force of the vehicle; and

a braking force control means for controlling the braking forces of the respective wheels on the basis of the computed target braking forces of the respective wheels.

10. A braking force distribution control device according to claim 9, further comprising:

a braking operation amount detecting sensor which detects a braking operation amount of a driver of the vehicle; and

target braking force computing means for computing a target braking force of the vehicle on the basis of the braking operation amount.

11. A braking force distribution control device according to claim

9, wherein the wheel target braking force computing means computes the target braking forces of the respective wheels such that values of the road surface  $\mu$  slopes of the respective wheels are substantially equal.

12. A braking force distribution control device according to claim 10, wherein the wheel target braking force computing means computes the target braking forces of the respective wheels such that values of the road surface  $\mu$  slopes of the respective wheels are substantially equal.

13. A braking force distribution control device according to claim 9, wherein the wheel target braking force computing means computes the target braking forces of the respective wheels such that values of the road surface  $\mu$  slopes of rear wheels of the vehicle are greater than values of the road surface  $\mu$  slopes of front wheels of the vehicle.

14. A braking force distribution control device according to claim 10, wherein the wheel target braking force computing means computes the target braking forces of the respective wheels such that values of the road surface  $\mu$  slopes of rear wheels of the vehicle are greater than values of the road surface  $\mu$  slopes of front wheels of the vehicle.

15. A braking force distribution control device according to claim 9, wherein the wheel target braking force computing means computes the target braking forces of the respective wheels such that the target braking force is large for a wheel whose road surface  $\mu$  slope value is high and the target braking force is small for a wheel whose road surface  $\mu$  slope value is low.

16. A braking force distribution control device according to claim 10, wherein the wheel target braking force computing means computes the target braking forces of the respective wheels such that the target braking force is large for a wheel whose road surface  $\mu$  slope value is high and the target braking force is small for a wheel whose road surface  $\mu$  slope value is low.